

REMARKS/ARGUMENTS

The rejection in response to Applicants' argument filed on January 24, 2007 asserts that a surface of the gate constitutes a surface of the semiconductor device. Applicants have respectfully amended Claims 1, 11 and 21 to further define what Applicants consider as the surface of the semiconductor device.

Claim Rejections 35 U.S.C. §112

Claims 1, 11 and 21 are rejected, under 35 U.S.C. §112, second paragraph, as allegedly having insufficient antecedent basis. Applicants respectfully disagree and kindly direct the Examiner to the preamble of each respective claim reciting a semiconductor device, as claimed. Accordingly, "said semiconductor" in line four of Claims 1, 11 and 21 do have sufficient antecedent basis. Thus, withdrawal of the rejection is earnestly solicited.

Claim Rejections 35 U.S.C. §103

Claims 1-2, 6-12, 16-22 and 26-48 are rejected, under 35 U.S.C. §103(a), as being allegedly unpatentable over Takahashi, et al. U.S. Pub. No. 2001/0024859 (hereinafter Takahashi). The Applicants respectfully traverse the rejection in view of the following.

Independent Claim 1 recites a limitation whereby a plurality of conductive sub-surface regions are formed beneath a well comprising a channel of the semiconductor for routing a body-bias voltage, as claimed. Accordingly, the plurality of conductive sub-surface regions is beneath the well comprising the channel (e.g., n regions, p regions, etc.).

In contrast, Takahashi discloses semiconductor regions 22nb, 23nb, etc., of respective MOS devices (see Takahashi, paragraph 205). The semiconductor regions 22nb, 23nb, etc., are placed above the P-type well, PWm, N-type well, and the semiconductor substrate 1 (see Takahashi, Figure 49). Thus, Takahashi fails to teach or suggest that a plurality of conductive sub-surface regions are formed beneath a well comprising a channel of the semiconductor, as claimed. Moreover, Takahashi explicitly teaches away by disclosing that the alleged conductive sub-surface regions are placed above the P-type well, PWm, N-type well and the semiconductor substrate.

Furthermore, the rejection asserts that Takahashi teaches the conductive sub-surface regions because Takahashi is capable of routing a body-bias voltage. Applicants respectfully disagree and reiterate Applicants' previous argument filed on January 24, 2007 that to establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations (see MPEP 2100-126). The mere fact that a

structure is capable of certain operation does not explicitly teach or suggest that operation or the desirability of that operation. Accordingly, *assuming arguendo* that Takahashi is capable of routing a body-bias voltage as suggested by the rejection, such capability fails to explicitly and sufficiently teach or suggest a sub-surface structure for routing a body-bias voltage, as claimed.

Importantly, Applicants respectfully assert that the structure, as disclosed by Takahashi, is incapable of routing body biasing voltage in the claimed fashion in view of the following. Body biasing by definition describes the changes in the threshold voltage by the change in the source-bulk voltage. The rejection alleges that regions 22n, 22p, etc., are the conductive regions, as claimed. *Assuming arguendo* that the alleged regions 22n, 22p, etc., are the conductive regions, regions 22n, 22p, etc. also form the source and the drain of the semiconductor (see Takahashi, Figure 49 and accompanying text). Accordingly, the source and the alleged conductive regions are the same, thereby have the same potential. Thus, no body biasing can be created because the source-bulk are the same and no potential difference can be created. Accordingly, the structure of Takahashi, by definition, fails to route a body-bias voltage, as claimed.

Moreover, in order to change the threshold voltage and apply a body bias, the conducting structure should be the same type as the well body (see N-well 1, N-well 2, DNW of 310, 396 and 397 in Figure 2B of the instant application). In

contrast, Takahashi discloses that the alleged conductive sub-surface regions (e.g., see Takahashi, Figure 49, elements 22nb, 22na), being n-type, have a P-well (see Takahashi, Figure 49, element PWp1). Accordingly, the structure, as disclosed by Takahashi, cannot be body biased in the claimed fashion because the semiconductor region 22n has a P-well which is different type than the N region of the semiconductor. Similarly, other regions of Takahashi have a corresponding well that is a different type from the semiconductor region. As such, Takahashi is incapable of routing a body-bias voltage, as claimed.

The rejection without any explanation further relies on Takahashi Figures 19a-20b. Applicants respectfully submit that the relied upon Figures of Takahashi fail to teach or suggest routing body-bias voltage in the claimed fashion, under similar rationale presented above.

Further, as discussed by Applicants in the response filed on January 24, 2007 but not addressed by this rejection, Takahashi is inoperable for routing body-bias voltage in the claimed fashion because of its physical limitations due to the enclosure. For example, as discussed in the previous response Takahashi discloses that semiconductor regions 22nb, 23nb, etc., are placed above the P-type well, PWm (see Takahashi, Figure 49). Semiconductor regions 22nb, 23nb, etc., are further adjacent to semiconductor regions 22na, 23na, etc., as well as isolation areas SGI (see Takahashi, Figure 49). Moreover, semiconductor

regions 22nb, 23nb, etc., are below the L1 metal structure as well as insulating films 12a and 12b (see Takahashi, Figure 49).

Accordingly, the semiconductor regions 22nb, 23nb, etc., are enclosed by P-type well PWm and semiconductor regions 22na, 23na, etc., and isolation areas SGI and L1 metal structure and insulating films 12a and 12b. The enclosure of the semiconductor regions 22nb, 23nb, etc., renders the semiconductor regions 22nb, 23nb, etc., inoperable for routing body-bias voltage in the claimed fashion because of their physical limitations due to the enclosure. Therefore, Takahashi fails to teach or suggest a sub-surface structure for routing a body-bias voltage, as claimed and teaches away by showing the semiconductor regions 22nb, 23nb, etc., enclosed and inoperable for routing the body-bias voltage in the claimed fashion.

Accordingly, Takahashi fails to teach or suggest the limitations of independent Claim 1. As such, Takahashi fails to render independent Claim 1 obvious, under 35 U.S.C. 103(a). Independent Claims 11 and 21 recite limitations similar to that of independent Claim 1 and are patentable for similar reasons. Dependent claims are patentable by virtue of their dependency.

As per Claims 2 and 22, the rejection asserts that Takahashi teaches a sub-surface structure that is a diagonal sub-surface mesh structure. The rejection

in response to Applicants' argument filed on January 24, 2007 photocopies Figures 19a-20b with a diagonal line drawn across contact holes (SC). Applicants respectfully submit that because the rejection draws a diagonal line across structures in Takahashi does not transform the sub-surface structure to a diagonal sub-surface mesh structure, as claimed.

As per Claim 29, the rejection relies on (US Patent No. 5,554,554) (hereinafter Bastani) disclosing that integrated circuits using two layers of polycrystalline silicone interconnections are well known (see Bastani, col. 1, lines 47-49). As such, Bastani fails to explicitly disclose or suggest that use of a polysilicon wire, as claimed is well known.

As per Claim 30, the rejection without any support asserts that "doping of the polysilicon interconnection to increase its conductivity is well-known." Applicants respectfully disagree and interpret the assertion as an Official Notice. As such, Applicants respectfully direct the Examiner to MPEP §2144.03(A), which states that "[i]t is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based" (see *Zurko*, 258 F.3d at 1385, 59 USPQ2d at 1697). Moreover, the Applicants respectfully remind the Examiner that in support of an Official Notice the Examiner must point to some concrete evidence in the record in support of these findings to satisfy the substantial evidence test (see

MPEP 2144.03(c)). If the Examiner is relying on personal knowledge to support the finding of what is known in the art, the Examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding (see 37 CFR 1.104(d)(2) and see MPEP 2100-144).

As per Claims 10, 20 and 32, the rejection without addressing Applicants previous response merely states that Figure 49 of Takahashi shows the claimed limitations. Applicants respectfully disagree because the semiconductor region 23nb is separate and not connected to the semiconductor region 22nb (see Takahashi, Figure 49), as discussed by the Applicants in the response filed on January 24, 2007 but not addressed by this rejection. Accordingly, Takahashi fails to teach or suggest a second conductive sub-surface region that overlaps the sub-surface structure, as claimed.

As per Claim 34, the rejection alleges "that the plurality of conductive sub-surface regions inherently form a conductive path and the conductive path would inherently be capable of routing the body-bias voltage." Applicants respectfully disagree and assert that the alleged conductive sub-surface regions of Takahashi fail to teach or suggest routing the body-bias voltage, as claimed, under the rationale discussed above.

Moreover, Applicants respectfully submit that to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that inherency may not be established by probabilities or possibilities (see *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). Thus, “in relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art” (see *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)). As such, a mere allegation that something is inherent is not sufficient.

The rejection further asserts that “how the plurality of conductive sub-surface regions are selected has not been given patentable weight since claims are directed to a structure.” Applicants respectfully disagree because how the plurality of conductive sub-surfaces are selected further defines the structural property of the recited structure. Thus, the recited limitation should be given patentable weight.

As per Claims 35, 40, 45, 36, 41, 46, 39 and 44, the rejection merely asserts that the recited limitations are inherent based on the disclosure of Figure 49 of Takahashi. Applicants respectfully submit that a blanket assertion based on inherency is improper, as presented and discussed above with respect to Claim

34. As such, withdrawal of the rejection or appropriate correction to the rejection is earnestly solicited.

As per Claims 36, 41, 46, 39 and 44, the rejection similar to Claim 34 states that the limitation is not given patentable weight. Applicants respectfully disagree under similar rationale presented above.

As such, allowance of Claims 1-2, 6-12, 16-22, and 26-48 is earnestly solicited.

For the above reasons, the Applicants request reconsideration and withdrawal of rejections under, 35 U.S.C. §112 and 35 U.S.C. §103(a).

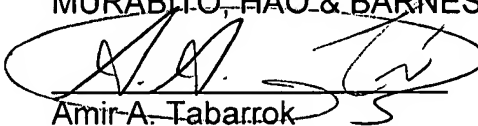
CONCLUSION

In light of the above listed remarks, reconsideration of the rejected Claims 1-2, 6-12, 16-22, and 26-48 is requested. Based on the arguments presented above, it is respectfully submitted that Claims 1-2, 6-12, 16-22, and 26-48 overcome the rejections of record and, therefore, allowance of Claims 1-2, 6-12, 16-22, and 26-48 is earnestly solicited.

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Respectfully submitted,
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